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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,472	02/11/2004	Daniel James Branagan	NANO004U	4067
32047	7590	11/16/2006		
GROSSMAN, TUCKER, PERREAULT & PFLEGER, PLLC 55 SOUTH COMMERCIAL STREET MANCHESTER, NH 03101				
			EXAMINER ZHENG, LOIS L	
			ART UNIT 1742	PAPER NUMBER

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/776,472

Applicant(s)

BRANAGAN, DANIEL JAMES

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6, 7 and 9-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-7 and 9-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 6 and 11 are amended in view of the amendment filed 7 September 2006. New claims 13-16 are added in view of the amendment. Therefore, claims 6-7 and 9-16 are currently under examination.

### ***Status of Previous Rejections***

2. The rejection of claims 6-7 and 9-12 under 35 U.S.C. 112, first paragraph, is withdrawn in view of the amendment filed 7 September 2006.

### ***Claim Interpretation***

3. Regarding claims 6 and 11, since no specific order is required for executing processing steps (a) – (d), the examiner is interpreting that the sequence of the claimed processing steps can take place in any order. In addition, since processing steps (a)-(d) recite the same iron based metallic coating alloy and the metal surface is relatively clean(i.e. the cleaned surface may still contain oxides) with the application of the iron based metallic coating alloy, the examiner is interpreting that the processing steps (c) and (d) may take place simultaneously(i.e. steps(c) and (d) are the same coating application step) based on the broadest reasonable interpretation.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6-7 and 9-12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dardi et al. US 4,615,864 (Dardi).

Dardi teaches a process for coating iron-based superalloy using a metallic coating composition comprising 10-50% Cr, 0.1-10% Mn, up to 5% of La, up to 10% Hf, up to 5% Ti, up to 12% Si and balanced with Fe (abstract). Dardi further teaches that its metallic coating is applied by plasma spraying(col. 3 lines 27-31).

Regarding claim 6 and 11, the Cr, Hf, La and Ti, in a calculated total amount of 10-70%, in the metallic coating of Dardi read on the claimed deoxidizing element in the claimed amount range. In addition, since the iron-based metallic coating of Dardi is applied by plasma spraying, Dardi inherently teaches the claimed melting of the iron-based metallic coating to a liquid state. Furthermore, the claimed removing of oxidized metal surface layer, which reads on a metal surface with a native oxide layer, to provide a relatively clean metal surface is inherently taking place in the coating application process of Dardi. Lastly, the examiner take a position that the claimed ASTM C633 bond strength is an inherent property of the metallic coating layer. Therefore, the coating layer formed by the coating process of Dardi would also inherently have an

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ASTM C633 bond strength of at least 5500psi as claimed. Alternatively, one of ordinary skill in the art would have found the claimed ASTM C633 bond strength of at least 5500psi obvious in the metallic coating formed by the coating process of Dardi since Dardi uses the same metallic coating as claimed and a same coating process as claimed.

Regarding claim 7, since Dardi does not teach the presence of precipitates in the liquid state of the coating alloy used for plasma spray coating, the examiner construes that the precipitates is not present in the molten coating alloy of Dardi based on the broadest interpretation.

Regarding claim 9-10, the plasma spraying technique of Dardi reads on the claimed thermal spraying technique.

Regarding claim 12, the Si in the iron-based metallic coating of Dardi read on the claimed oxygen seeking nonmetal/metalloid as claimed.

7. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dardi.

The teachings of Dardi are discussed in paragraph 6 above.

Regarding claims 13-16, the 0.1-10% Mn in the metallic coating of Dardi encompasses the claimed Mn in the amount of about 0.8% or about 2.3%. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05. The selection of claimed Mn amounts from the disclosed range of Dardi would have been obvious to one skilled in the art since Dardi teaches the same utilities in its' disclosed Mn amount range.

***Response to Arguments***

8. Applicant's arguments with respect to claims 6-7 and 9-12 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LLZ

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SUPERVISORY PATENT EXAMINER  
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